

after capturing them with nets through a drive and releasing them after harvesting the musk. If an arrangement could be made at village level through local panchayats on an annual basis for the benefit of a specific village community, such a programme would generate a self-supporting economy, which means concrete support for

wildlife conservation at grassroots level. In addition to this, the villagers would themselves become watchdogs against poaching, ensuring the survival of the endangered Musk Deer in Nepal.

December 12, 1988.

MUKTI N. SHRESTHA

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10. SIGHT RECORD OF REDNECKED GREBE *PODICEPS GRISEIGENA* NEAR RAJKOT, GUJARAT

On 11 December 1986 at the Nyari reservoir, southwest of Rajkot city (22° 18' N, 70° 47' E), Gujarat, we observed two grebes diving under the water close to an islet on which both species of migrant cranes, Demoiselle Crane *Anthropoides virgo*, and Common Crane *Grus grus* were roosting.

The grebes were intermediate in size to our two common grebes, the Little Grebe *Podiceps ruficollis* and the Great Crested Grebe *P. cristatus*. Both these species occur regularly at this reservoir. These new arrivals were in their winter plumage and had a distinctly visible yellow base to the lower mandible, best illustrated by Peterson *et al.* (1983). This confirmed their identity to be the Rednecked Grebe *P. griseigena*. The same evening, we visited the reservoir with Prof. R.M. Naik and saw the birds again. This time they were further away and were resting in the

water. On later visits that winter the birds were not observed.

So far there have been only two records of the bird from the Indian subcontinent, on the basis of which Ali and Ripley (1983) consider the bird to be a rare winter visitor. These records are from Pakistan and were made by Holmes *et al.* (1967) of one bird in winter plumage, on 14 January 1967, and by Savage (1968), of two birds, of which one was in complete summer plumage, on 24 September 1967. There is no mention of this species from Gujarat, either in Ali (1954) or Dharmakumarsinhji (1955) and so it is believed to be an addition to the list of birds for the state.

November 17, 1987.

TAEJ MUNDKUR
RISHAD PRAVEZ

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11. MONTHLY VARIATIONS IN DIET OF CATTLE EGRET *BUBULCUS IBIS COROMANDUS* IN AND AROUND CHANDIGARH

Documentation on the feeding ecology of the Asiatic subspecies of the Cattle Egret *Bubulcus ibis coromandus* (Boddaert) is meagre. Ikeda (1956), Kosugi (1960), Mukherjee (1971), and McKilligan (1984) studied the food habits of this subspecies. Except for Mukherjee (1971), all

other workers made observations only during the breeding season. Accordingly, a study was conducted from February 1984 to February 1986 to gather comprehensive information on its feeding ecology. Some results of the investigations have been reported elsewhere (Sodhi and

Khera 1984, Singh *et al. in press* Sodhi). The present paper examines variations in the diet of the Cattle Egret during different times of the year.

MATERIAL AND METHODS

45 Cattle Egrets were shot from Chandigarh (30° 42'N, 76° 54'E) and surrounding areas between March 1984 and March 1985, each after at least one hour of feeding, so as to obtain maximum information. No egrets were shot during June, August, September or November. The stomach contents were preserved in different percentages of formaldehyde, depending on their nature. Contents of each stomach were categorized into different prey groups, namely Annelida, Odonata, etc., and counted.

To study the dominance of a particular prey group during different months, Simpson's dominance index $\lambda = S \sum P_i$ was calculated, following Ruiz (1985). P_i is the number of prey in one stomach divided by the total number of prey encountered in the same stomach. Simpson's dominance index is a measure of the expected frequency of particular prey and offers an estimate of dominance of a given prey group in the predator's diet (Ruiz 1985). Values less than 0.01 in preliminary calculations were discarded.

To estimate diversity in the diet, mean number of food items and mean number of food objects were calculated for different months. Food item, as referred here, is a particular food group, e.g. Annelida, Odonata, etc., and

food object is the total of all food items. Further, foraging index = mean number of food items/mean number of food objects x 100 was calculated for each month to get an idea of the quantities of food objects in terms of variety of food items, following Siegfried (1972).

RESULTS

Table 1 presents Simpson's dominance index for each prey group during different months. From the table it is evident that Coleoptera (January), Diptera (February to April), Lepidoptera (May and December), and Orthoptera (July and October) were the most important prey groups. Based on dominance index, Diptera, Orthoptera, and Coleoptera were the three most important prey groups (Table 2). Table 3 infers that Cattle Egrets consumed most diverse food in February and least diverse food in December.

DISCUSSION

From the analysis, it is evident that the Cattle Egret is predominantly an insect forager. It is morphologically adapted to feed on insects (Dubale and Mansuri 1969, 1972, Payne and Risley 1976).

The variations in their diet during different months may be due to: (a) availability of a particular prey group in nature during those months, (b) their ability to catch that particular prey, or (c) prey selection being influenced by

TABLE 1
SIMPSON'S DOMINANCE INDEX OF DIFFERENT PREY GROUPS IN DIFFERENT MONTHS

Prey group	Jan.	Feb.	Mar.	Apr.	May	Jul.	Oct	Dec.
Annelida	-	0.01	-	-	+	0.32	-	-
Odonata	0.17	+	0.04	-	0.05	-	0.01	-
Orthoptera	3.34	2.43	2.68	0.22	0.09	5.29	1.36	1.18
Dermaptera	+	+	0.06	0.01	-	-	0.45	-
Dictyoptera	+	+	+	-	-	+	-	-
Hemiptera	-	+	+	-	0.06	-	-	-
Coleoptera	4.75	0.67	0.65	0.04	+	1.96	+	+
Diptera	1.02	7.18 20.97	2.49	0.04	1.61	+	0.01	-
Lepidoptera	0.75	1.58	1.76	1.82	1.51	0.03	+	2.04
Hymenoptera	+	0.02	0.05	-	-	0.09	-	-
Arachnida	0.28	0.09	2.68	0.02	+	0.27	0.02 0.03	-
Chilopoda	-	+	-	-	-	-	+	-
Amphibia	-	-	-	-	-	0.07	-	-
Reptilia	-	-	-	-	-	+	-	-
Mammalia	-	-	-	-	-	-	-	+
Sample size	7	7	11	4	3	7	2	3

+ = Values less than 0.01.

TABLE 2
SIMPSON'S DOMINANCE INDEX OF DIFFERENT PREY
GROUPS. II IS
PERCENTAGE OF DOMINANCE INDEX VALUES

Prey group	I	II
Annelida	0.57	0.19
Odonata	1.06	0.36
Orthoptera	107.53	36.63
Dermaptera	0.77	0.26
Dictyoptera	+	-
Hemiptera	0.09	0.03
Coleoptera	29.92	10.19
Diptera	132.02	44.97
Lepidoptera	7.68	2.61
Hymenoptera	0.77	0.26
Arachnida	13.03	4.43
Chilopoda	+	-
Amphibia	0.07	0.02
Reptilia	+	+
Mammalia	+	+

+ = Values less than 0.01

some physiological stimuli (Ruiz 1985).

The most important prey group during the present study was Diptera. Earlier, Orthoptera was found to be the most important prey group in Egypt, South Africa, Sundarban (India), North America, Australia, while Coleoptera and Amphibia were the most important in Japan and

TABLE 3
MEAN NUMBER OF FOOD ITEMS CONSUMED AND FORAGING
INDEX
DURING DIFFERENT MONTHS

Month food items	Mean no. of index	Foraging
Jan.	4.14± 1.86	3.58
Feb.	6.85± 2.73	2.16
Mar.	6.18± 1.40	7.37
Apr.	5.25± 0.95	8.03
May	5.00± 0.0	25.50
Jul.	4.42± 1.90	24.40
Oct.	6.50± 0.70	26.00
Dec.	4.00± 1.73	15.00

Spain (Kadry-Bey 1942, Siegfried 1966, Mukherjee 1971, Jenni 1973, McKilligan 1984, Ikeda 1956, Ruiz 1985). The dominance of a particular prey group in diet, in a region, is perhaps due to abundance of that prey group in that region (Sodhi 1985).

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12. BROWN BOOBY *SULA LEUCOGASTER* (BODDAERT) ON THE WESTERN COAST

(With a text-figure)



Fig. 1. Brown Booby *Sula leucogaster*.

While bird watching at Mandvi in Kutch, Gujarat, on 22 August 1987, some distance short of the mouth of River Rukmavati which joins the Arabian Sea, opposite the town and port of Mandvi, a fisherman told us that he had seen a sea bird which he said he had not come across before. When we went to the spot pointed out by him we saw a Brown Booby *Sula leucogaster*, sitting quietly. We approached it very close and even when we caught it, it showed no signs of fright. We therefore felt it was either injured (there was no external sign of injury) or ill. We then had the bird photographed. On studying the literature it appears that except for a specimen collected from the Malabar coast, this is the only record for the western sea board. M.K. Himmatsinhji, to whom we showed the photo and who has confirmed our identification of the Brown Booby, thinks it is an accidental occurrence, and that we should try to collect it as specimen for the Society.

September 22, 1987.

S.N. VARU
N.N. BAPAT

13. OCCURRENCE OF *CICONIA CICONIA* GRUIDAE AND BREEDING OF PHOENICOPTERIDAE IN KUTCH, GUJARAT

Apparently the White Stork was first recorded in Kutch, Gujarat, by Capt. C.D. Lester during the last century; he saw a pair of them at Devisar tank (about 14 Km. north of Bhuj) in August 1895. The Salim Ali survey in 1943–44, prior to the publication of 'The Birds of Kutch', did not come across it. However, I am not aware whether he himself or anyone else recorded *Ciconia ciconia* in Kutch in subsequent years. I saw one in the Banni in December 1954. Since then I have come across them in ones and twos on several occasions, but during the last decade or more an ever increasing number of these storks have been seen. The number of *C. ciconia* mentioned by A.A. Vaidya in his note in *J. Bombay nat. Hist. Soc.* 83(2): 433, appears to me rather highly exaggerated. It is likely he counted some birds in flight which also included flying

Pelicans *Pelicanus onocrotalus* which it is possible were mistaken for White Stork. The 'famous dhandh' mentioned by Vaidya (the word 'dhandh' in Sindhi and Kutchhi means a shallow collection of water) is known as the 'dhandh' of Chhari, a village nearby, where the Greylag Geese used to come in large numbers in the years gone by. They no longer visit Kutch now. This lagoon is situated almost where 'mainland Kutch' ends and a part of the western Banni begins, about 30 Km. or so from where the Great Rann of Kutch is situated. I call this wetland 'mini Nal Sarovar'. I have come across this bird over the years as hereunder:

I counted 40 in the marshes on both sides of the Bhuj–Pachham road in the Banni in 1979. On 10 February 1980 I saw 100+ White Storks in the marshes interspersing and surrounding a large collection of water about 4 Km.